

BESS-P TOF Bracket Support Assembly

Design Analysis Summary

- Bracket Design has evolved from an earlier model flown on BESS. It is good to have some flight heritage.
- Bracket Design has 32 parts (not including the extra parts required to adapt the design to the Upper assembly). Current mass is ~93 grams.
- Bracket Design, due to the way it handles loads and lack of stiffness, uses the Lightguide (LG) to carry bending loads induced by the PMT mass. This stresses the LG at the “fulcrum” near the support rib and the optical joint is stressed. Usually this situation should be avoided.
- Spring tension for PMT pre-load is supplied by 4 compression springs. Currently the holes in the PMT flange are threaded. These will have to be drilled out to allow springs to work. This is dangerous to the PMT.
- Bracket Design requires a modification to the outer physical design envelope (i.e. needs larger outer radius to accommodate support ribs).
- Mods suggested: Bracket stiffness could be improved by 1) shortening the cantilever and/or 2) adding stiffening ribs under the angle. And 3) the PMT angled plate (piece under the PMT) could be made continuous with the angle so as to extend the composite section underneath the PMT mass. Applying 1) would help stiffen the assembly but does not remove the LG from being the load bearing member. Applying 2) and 3) would increase overall mass.
- Tests suggested: perform in three mounted configurations, 1) PMT axis normal to floor and 10 lb PMT, 2) PMT axis at 45 deg angle to floor with 10 lb PMT, and 3) PMT axis parallel to floor with a 5 lb PMT. Five and 10 lb PMTs here represent static design loads of 5 g and 10 g respectively. Monitor deflections and modes.

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